Ichthyological Illustrations

By Gilbert P. Whitley

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(Figures 1-12.)

Since my book, the "Fishes of Australia, Part 1 (Sharks, Rays, &c.)," was published in 1940, I have been collecting illustrations of Australian teleost fishes towards the later volumes I have been writing. Many of these figures have been printed in the publications of the Australian Museum, the Royal Zoological Society and other institutions, and the blocks have been put aside towards the main work. I continue to present ichthyological illustrations, because I am assured that they are of use to my fellow workers and students, though there appears to be no immediate prospect of publication of further volumes of my "Fishes of Australia." This is mentioned by way of explanation for the "mixed bag" presented in this paper. At first sight, what may appear to be scatteralia, is really a series of notes and figures which, with the others I have published, fill numerous gaps in an effort to illustrate at least every genus of Australian fishes. About the first third of them (from *Elops* to *Epinephelus*) is now tolerably complete, but at least seventy genera of major importance have yet to be illustrated, apart from novelties which are being discovered as the work progresses.

I am grateful to Dr. A. A. Racek of the Fisheries Branch, Chief Secretary's Dept., Sydney, for his excellent photographs of juvenile specimens.

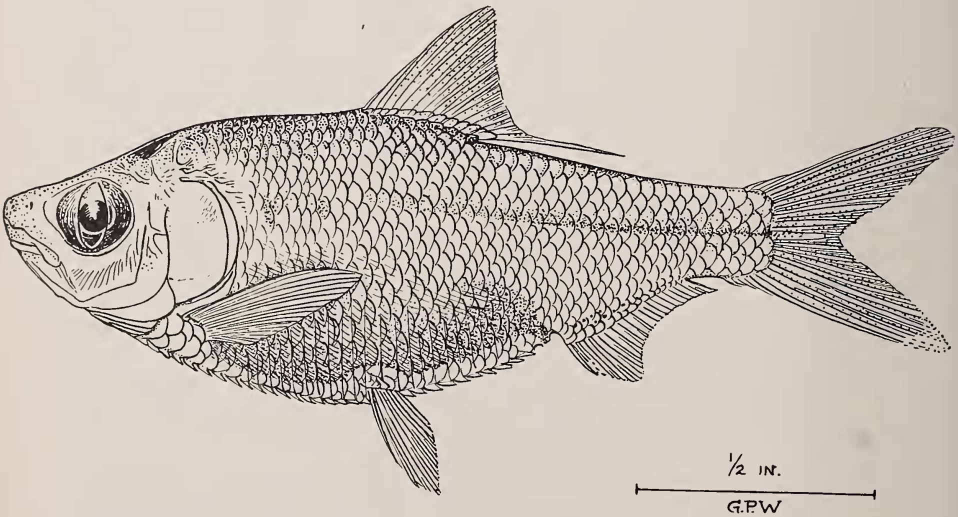

Figure 1.—Hairback Herring, *Fluvialosa erebi.* Juvenile from Queensland.

G. P. Whitley del.

Family CLUPANODONTIDAE.

Genus FLUVIALOSA Whitley, 1943.

FLUVIALOSA EREBI Gunther, 1868.

(Figure 1.)

I here describe and figure a juvenile, largest of many specimens collected by Mr. Ian Munro at Paluma Shoals, near Townsville, Queensland, on 29 Nov. 1941.

D. 14, A. 21; P. 17; V. 9. Sc. *c.* 40. Tr. 18. Predorsal 19. Scutes 18 + 13 = 31.

Head (13 mm.) 3, depth (14) 2.8 in standard length (40). Eye (5) 2.8 in head. Predorsal length nearly 20 mm.; anal base, 7; distance from ventral to anal origins 10 mm., thus less than head; length of pectoral 9.5; of ventral nearly 7; anal lobe nearly 5 mm.; interorbital 3.5 mm.

General facies as figured. Snout terminal. Eye large. Maxilla just reaching below front of eye.

Scales small, cycloid, without basal striae, about 35 around the body, and 14 around caudal peduncle. Axillary scales moderate, that of ventral fin with small auxiliary scales. Scaly sheaths to dorsal and anal fins. Large dorsal ray 8 mm. in largest, considerably shorter in others; the fin consists of three reduced simple and 13 branched rays, the first branched ray being highest. Ventral fin behind level of dorsal origin.

Colour in formalin, reddish-brown. Head, abdomen and fins whitish. Spaced brown chromatophores in snout. Brain yellow. A dark brown patch each side of occiput. Dark brown marks along each side of back from snout to tail. Some dark chromatophores around root of tail and over caudal rays; a few more over anal base. Eye and viscera dark blue. An indistinct cluster of chromatophores appears to foreshadow a humeral blotch and there is a dusky stripe along middle of each side of body posteriorly (or extending from head to tail in some examples).

Described and figured from a specimen, 40 mm. in standard length or 2 inches overall. Austr. Mus. regd. No. IB. 1997. Also more than 100 smaller fishes, IB. 1998-1999, with same data.

Loc.—Paluma Shoals, near Townsville, Queensland; 29 November 1941, coll. by Mr. I. S. R. Munro and presented by the Council for Scientific and Industrial Research. Marine.

Family GALAXIIDAE.

Genus GALAXIAS Cuvier, 1816.

GALAXIAS KAYI Ramsay and Ogilby, 1886.

(Figure 2.)

Galaxias kayi Ramsay & Ogilby, Proc. Linn. Soc. N. S. Wales (2) i, May 1886, p. 6. Fifth Creek, Torrens system, South Australia. Types in Australian Museum seen.

Id. Stokell, Rec. S. Austr. Mus. viii, 4, 1947, p. 671.

Id. T. Scott, National Park & Reserves (S. Austr.) 1953, p. 114, fig.

Galaxias olidus of authors, not of Gunther, 1866 (see Stokell, *loc. cit.*).

Galaxias oconnori Ogilby, Mem. Qld. Mus. i, 1912, p. 33. Lyra, south Queensland.

Id. McCulloch & Whitley, Mem. Qld. Mus. viii, 1925, p. 133 (listed).

Id. Duhig, Proc. Roy. Soc. Qld. xlii, 1931, p. xvi (melanosis and trematode).

Id. Whitley, Rec. Austr. Mus. xix, 1933, p. 61, pl. xii, fig. 3 (holotype figured) and Austr. Zool. xii, 1955, p. 155, fig. 2.

Lyragalaxias oconnori Whitley, Vict. Nat. lii, 1935, pl. iii, fig. 5.

D. 4, 9; A. 3, 9; P. 15; V. 7; C. 14 branched rays.

Head (12 mm.) 4.8, depth (8) 7.2, predorsal length (39) 1.4, distance from ventral to anal origins (12) 4.8 in standard length (58) or 5.5, 8.2, 1.7 and 5.5 respectively in total length (66). Eye (3) 1.7 in interorbital (5) which equals maxilla. Eye in second fourth of length of head.

Snout, 4 mm.; preventral length, 30; snout to origin of anal, 41.5; length to end of anal base, 47.5; to end of dorsal base, 46; anal base, 6; its height, 7.5, equals dorsal base and slightly exceeds dorsal's height.

General form and proportions as figured. Lower jaw slightly longer. Maxillary reaches below front third of eye. Teeth in narrow strips, the outer row enlarged, curved, brown-tipped. Similar teeth on tongue and palatines.

About 8 to 10 gill-rakers on lower part of first gill-arch. Nostrils and mucous pores as in *Galaxias* spp. Myomeres about 18 to ventrals and 32 to anal. Vent behind level of dorsal origin.

Fins rounded. Anal fin adpressed, overlaps procurrent caudal. Origin of anal before level of middle of dorsal base. Sixth pectoral ray longest not nearly reaching half way to ventral. Ventral inserted about half way between snout and root of caudal.

Caudal emarginate with 14 branched rays with 1 simple and 7 procurrent rays above and below them.

Colour, in alcohol, yellowish with indistinct brown patches. Fins clear. Eyes blue.

Described and figured from a specimen, 58 mm. in standard length or 2⅝ inches overall; Australian Museum regd. No. I. 14375 (largest of 39 specimens).

Loc.—Yetholme near Bathurst, New South Wales.

39 specimens (I. 14375) from Miss M. Erhard, and 7 (IB. 1355) from Dr. L. May, up to 3½ inches long.

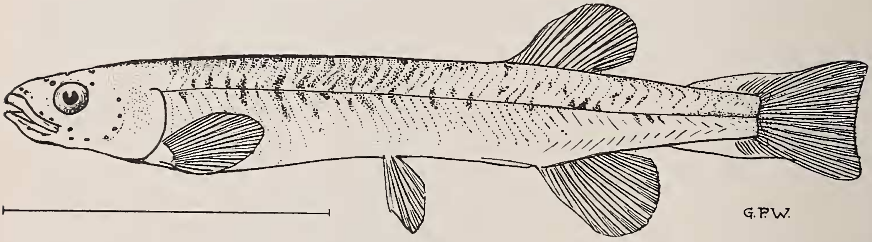

Figure 2.—Murray Galaxias, *Galaxias kayi*. Specimen from New South Wales.

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Family MYCTOPHIDAE.

Genus MYCTOPHUM Rafinesque, 1810.

MYCTOPHUM CUVIERI (Castelnau).

(Figure 3.)

Scopelus cuvieri Castelnau, Proc. Zool. Acclim. Soc. Vict. ii, May 10, 1873, p. 106. Knob Island, Queensland. Type in Paris Museum.

Id. Macleay, Descr. Cat. Austr. Fish, ii, 1882, p. 158.

Id. Lutken, Vidensk. Selsk. Skr. (6) vii, 1892, Spolia Atlantica, ii, p. 242, *fide* Waite, Rec. Austr. Mus. v, 1904, p. 156.

Myctophum cuvieri Fraser-Brunner, Proc. Zool. Soc. Lond., 118, 1949, p. 1057 and fig.

Here figured from a facsimile of Fraser-Brunner's 1949 illustration of this rare species, originally described from "Knob Island, Torres Strait." Perhaps the locality Noble Island (144° 50′ E. long. by 14° 30′ S. lat) was intended.

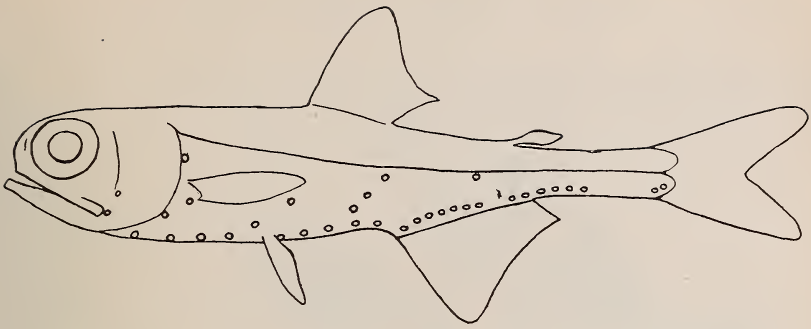


Figure 3.—Lantern Fish, *Myctophum cuvieri.* Type from Queensland.
After Fraser Brunner.

Genus ELECTRONA Goode and Bean, 1895.

ELECTRONA CARLSBERGI (Taning).

(Figure 4.)

Myctophum carlsbergi Taning, Vidensk. Medd. Dansk. nat. Foren, 94, 1932, p. 126, fig. 1. East of New Zealand.
Electrona carlsbergi Fraser-Brunner, Proc. Zool. Soc. Lond., 118, 1949, pp. 1029 and 1048 and fig. *Id.* Bertelsen and Marshall, Dana Rept. 42, 1956, p. 13, footnote. *Id.* Graham, Treasury N.Z. Fish, ed. 2, 1956, p. 400.

The illustration is after Taning; the species was noted from southward of Australia, in the forties of south latitude, by Fraser-Brunner, 1949.

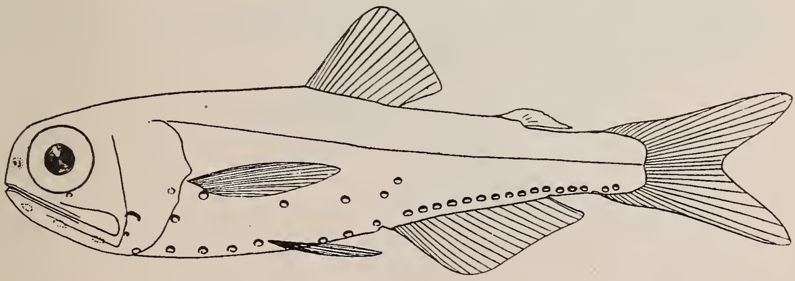
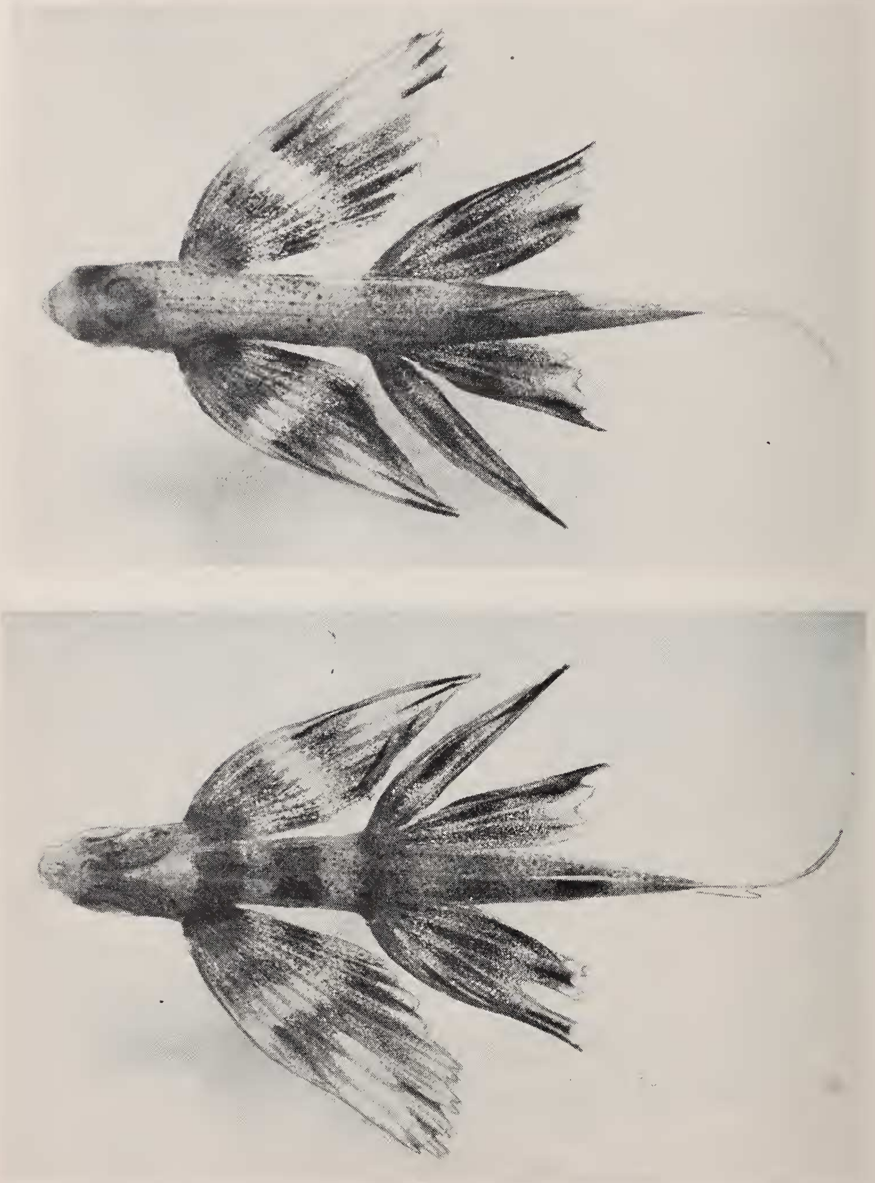


Figure 4.—Lantern Fish, *Electrona carlsbergi.* Type from east of New Zealand.

After Taning.

Family EXOCOETIDAE.
Genus CYPSILURUS Swainson, 1839, s.l.
CYPSILURUS MELANOCERCUS (Ogilby).
(Figures 5 & 6.)



Figures 5 & 6.—Dorsal and ventral views of a young Flying Fish, *Cypsilurus melanocercus*, from New South Wales.
Photo.—Dr. A. A. Racek.

Exocoetus melanocercus Ogilby, Proc. Linn. Soc. N. S. Wales x, June 1885, p. 123. Off Port Jackson, New South Wales.

Cypsilurus melanocercus Waite, Mem. Nat. Club N.S.W. i, 1904, p. 21. *Id.* Stead, Fish. Austr. 1906, pp. 64 & 70; Edib. Fish N.S.W., 1908, p. 39. *Id.* Ogilby, Ann. Qld. Mus. ix, 1908, p. 5. *Id.* McCulloch, Austr. Zool. ii, 1921, p. 31. *Id.* Griffin, Trans. N. Zeal. Inst. liv, 1923, p. 249, pl. xxii. *Id.* Roughley, Austr. Mus. Mag. iii, 9, 1929, p. 298, fig. of living fish in flight, and Gt Barr. Reef, 1936, p. 272, pl. ix, fig. 1. *Id.* Whitley, Austr. Mus. Mag. ix, 4, 1947, p. 116 (eggs & young). *Id.* Powell, Native Anim. N. Zeal., 1947, p. 66, fig. 313. And of lists, as *Cypselurus* or *Cypsilurus*.

"Flyvefisk" Schmidt a.o., Dana's Togt omkring jorden, 1932, p. 161, fig. 114.

This is the largest flying fish in the world, reaching 19.8 inches in length with a wingspread of two feet. It is probably deserving of a new generic name as the type of *Cypsilurus* Swainson (*nuttalii* LeSueur) was a young fish with elaborate barbels and a very high dorsal fin. The young of "*Cypsilurus*" *melanocercus*, figured here, has no barbels and a low dorsal fin.

The figured juvenile has the following characters: D. 13; A. 10; P. 2-3, 13; V. i, 5; L. Lat. c. 46. The pectoral and ventral fins are much shorter than in *Hirundichthys* of similar length from New South Wales, and the anal origin is well behind the level of that of the dorsal. Dimensions in mm.: Head, 8; snout, 2.4; eye and interorbital, 4; pectoral length, 20; ventral 15; predorsal, 22; depth, 6; preventral length, 18; preanal, 26; standard length, 36; total length, 45.

Colour in formalin: ground colour pale yellowish brown with dark greyish-brown markings as figured. Pectoral and ventral fins mostly dark greyish-brown, but with hyaline interspaces. Dorsal and anal mostly white with small dusky areas. Caudal white. It was the only one collected of seven seen by Mr. T. H. Webb swimming near Garden Island, Port Jackson, in the first week of December 1945 (Austr. Mus. regd. No. IB. 1436). He noted, "the dark lines are vivid red in life . . . six of the seven had the red colouring, the other very dark or black."

Family EPINEPHELIDAE.

Genus PROMICROPS Poey, 1868.

PROMICROPS LANCECLATUS (Bloch, 1790).

(Figure 7.)

Here figured from the smallest specimen known to me of the Queensland Groper which grows to more than seven feet in length. This juvenile is only 48 mm. (1⅞ inches) long and was netted by Mr. Harold Cogger in 3 feet of water amongst zostera and posidonia weed at Woy Woy, New South Wales, on 28 April 1956. It was then about 1¼ inches long, with the same brilliant yellow and jet black pattern as it had after nearly 3 months in an aquarium. It now has the following characters: D. xi, 16; A. iii, 8. Head (16.5 mm.) 2.3, depth (14) 2.7 in standard length (38). Eye (4) equals snout; interorbital, 3 mm.; maxilla, 8; its depth more than 2 mm.; depth of caudal peduncle 5.5 mm. Middle opercular spine longest and reaching farthest back, nearer lower than uppermost opercular spine. The coloration in spirit is black and cream, patterned as illustrated here.

Several authors have figured similar young fishes but not all of them have given measurements of their specimens (Bloch's type of *lanceolatus* and the banded juvenile in Day's Fishes of Malabar, for example). The Woy Woy fish is similar to the 8-inch specimen figured in colour in J. L. B. Smith's Sea Fishes of Southern Africa (pl. 19, right-hand fig. 452).

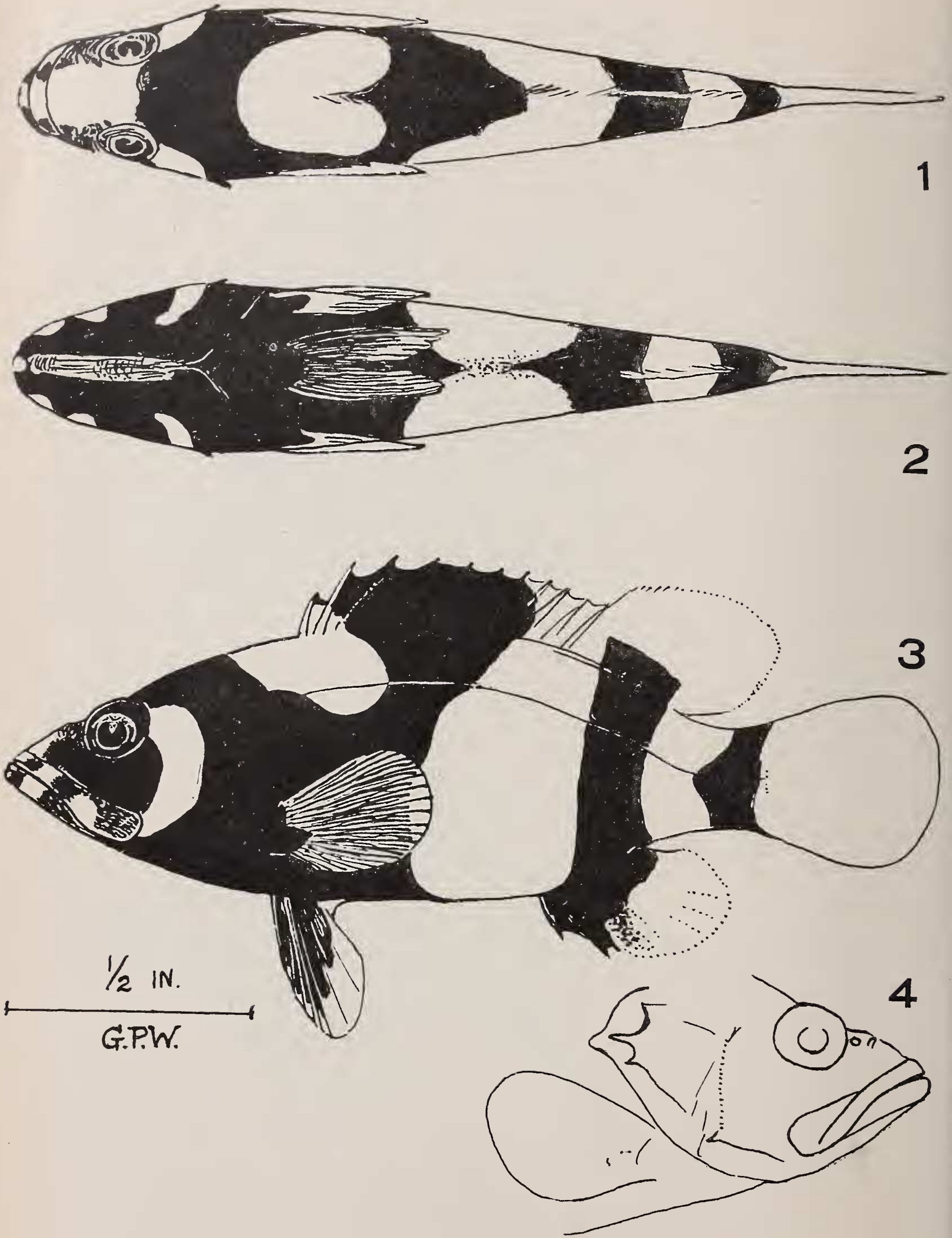


Figure 7.—Queensland Groper, *Promicrops lanceolatus*. Juvenile from New South Wales.
No. 1, dorsal; 2, ventral; 3, lateral views and 4, structure of foreparts.
G. P. Whitley del.

The disguise of this young fish afforded by its strongly contrasted pattern is an example of disruption of the creature's outlines for protective purposes similar to the cases given in Cott's Adaptive Coloration in Animals, 1940, esp. pp. 53 and 73, figs. 7, 13, 22 and 23. On the other hand there is some resemblance to such fishes as *Tetradrachmum* and *Amphiprion* which live in association with corals and sea-anemones, so that juvenile *Promicrops* may have some association, so far unsuspected, with some other marine organism, before it grows large enough to fend for itself, when its colour-pattern breaks up. Another case of striking coloration in a young fish is afforded by *Plectorhinchus chaetodonoides* (See Fowler, Bull. U.S. Nat. Mus. 100, xi, 1931, p. 257, fig. 21). Young *Coris* may be black with large white spots (Whitley, Rec. Austr. Mus. xxii, 1951, p. 401, fig. 8.).

Family CHAETODONTIDAE.

Genus THOLICHTHYS Gunther, 1868, s. lato.

Tholichthys Gunther, Ann. Mag. Nat. Hist. (4) i, 1868, p. 457, fig. Haplotype, *T. osseus* Gunther, from Zanzibar. *Id.* Day, Proc. Zool. Soc. 1870, p. 687. *Id.* Gunther, Ann. Mag. Nat. Hist. (4) viii, 1871, pp. 318-320, figs.; Journ. Mus. Godef. i, 2, 1873, p. 98, figs.; and Stud. Fish., 1880, p. 172, figs. 85-88. *Id.* Bleeker, Arch. Neerl. Sci. Nat. xi, 1876, ii, p. 305 (fide Weber & Beaufort, 1911). *Id.* Lutken, Vid Selks. Skr. Kjobenh. (5) xii, 6, 1880, pp. 569 and 608, pl. v, figs. 6-11. *Id.* Jordan, Gen. Fish. iii, 1919, p. 351. *Id.* Fraser-Brunner, Proc. Zool. Soc. 1933, p. 547, fig. 3. *Id.* Weber & Beaufort, Fish. Indo-Austr. Archip. vii, 1936, p. 1, figs. 1-4. *Id.* Fowler, Quart. Journ. Taiwan Mus. vi, 1953, p. 15, fig. 89.

Tetragonoptrus osseus Bleeker, Versl. Akad. Amst. (2) x, 1876, p. 318 (fide Weber & Beaufort, 1911). Not seen.

Tetragonoptrus (*Chaetodontops*) *dayi* Bleeker, Versl. Akad. Amst. (2) x, 1876, p. 319 (fide Weber & Beaufort, 1911). Not seen.

Osteochromis larvatus Franz, Abh. Akad. Munchen, Suppl. Band iv, 1, 1910 (1911), p. 52, pl. v, fig. 43.

Forcipiger longirostris Kendall & Goldsborough, Mem. Mus. Comp. Zool. xxvi, 1911, p. 306, pl. v, fig. 2.

The larval fish named *Tholichthys osseus* from Zanzibar by Gunther is generally regarded as a larval Chaetodontid, though its fincounts show that it is not a *Chaetodon* and Gunther later regarded it as more like a Cyttid.

Several families have *Tholichthys*-like larvae, some remarkable and curious forms of which have been described or figured in the above papers, though not all the genera to which they belong have been determined. I have not seen Bleeker's papers.

From New South Wales, the Australian Museum has recently received three postlarvae which seem nearest the Hawaiian *Tholichthys* of Fowler, 1953, of all the above references, but have different coloration and last dorsal rays much shorter; I name these below.

Genus CHAETODON Linnaeus, 1758, s. lato.

CHAETODON VITULUS, sp. nov.

(Figure 8.)

D. xiii, 22; A. iii, 18-19; P. 15; V. i, 5; C. 15 branched rays. L. Lat. 30 to 36. Sc., between head and hypural, 25 to 30. Tr. 7-10/1/18—23 from dorsal origin to anal base. Predorsal 3 or 4.

Head (11 mm.) 2 to 2.5, depth (18, 17, 15) 1.5 to 1.6 in standard length (28, 26, 24). Eye (4) 2.7 in head. Longest (2nd) dorsal spine, 7 mm. Interorbital, snout, and depth of caudal peduncle subequal (little over 3 mm.). Length of pectoral fin: 8, 7, 6 mm. Postorbital, including humeral plate, 5, 5, 4.5 mm.

General facies as figured in the accompanying photograph, for which I am indebted to Dr. A. A. Racek. Teeth compressed, uniserial. 15 gill-rakers on lower limb of first arch. Profile of snout mostly convex, except for slight dip before eye. Head-bones strongly granulated, the posterior ones with ripple-like ridges. Suprascapular and humeral plates overlap anterior body-scales. Preoperculum produced halfway back towards ventrals as a lobed plate. Form very compressed. Scales ctenoid. Lateral line tubes run around edges of head-bones, preoperculum, eyes, etc., and diverge into three branches over preorbital. Lateral line on body incomplete, situated very near back posteriorly and ceasing before caudal peduncle. Scale-rows of body ascending slightly posteriorly. Thoracic scales not enlarged.

Dorsal fins continuous, apparently no procumbent spine. The longest spine in the dorsal or anal fin is the second. Posterior margins of fins rounded, not vertical.

Colour, in formalin: yellowish to flesh-pink, with few small irregular dusky areas. Top of head yellow. A grey blotch over lower portions of 6th to 12th dorsal rays. Fins white or pinkish. Eye blue. In one small specimen there are darker inframarginal areas on soft dorsal and anal fins and rudiments of a dark ocular band.

Described and figured from the holotype (Austr. Mus. regd. No. IB. 3655), a specimen 33 mm. or 1.3 in. overall, and two paratypes (IB. 3656-7) of 30-31 mm., all trawled in New South Wales by Dr. A. A. Racek of the Fisheries Branch, Chief Secretary's Dept., Sydney.

Locs.—Jervis Bay, March 1954 (holotype); off Newcastle, 40-50 fathoms, sand and mud bottom, September 1956 (paratypes).

Vernacular name: Calf Fish, because it looks superficially like a young *Taurichthys*. Latin *vitulus*, a calf.

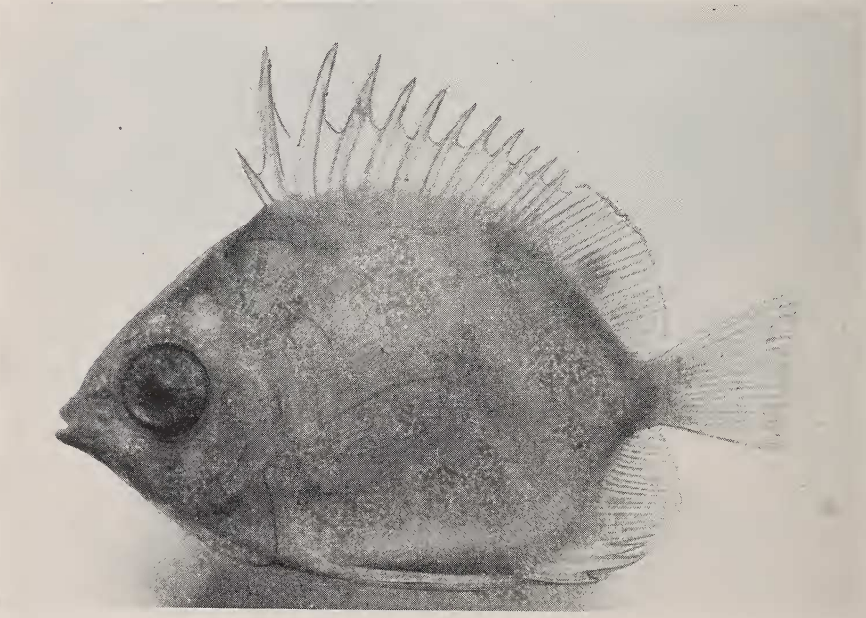


Figure 8.—Calf Fish, *Chaetodon vitulus*. Holotype from New South Wales.

Photo.—Dr. A. A. Racek.

Family CHEILODACTYLIDAE.

Genus CHEILODACTYLUS Lacepede, 1803.

Cheilodactylus Lacepede, Hist. Nat. Poiss. v, 1803, p. 5, pl. i, fig. 1. Haplotype, *C. fasciatus* Lacepede; no locality (Dutch collection).

Clodactylus Rafinesque, Anal. Nat., 1815, p. 88. Emendation. Same genotype.

Pteronemus Hoeven, Handb. Dierk. ii, 1833, p. 247, *fide* Neave, Nomencl. Zool. *Ibid.*, 1855 ed., p. 386; Hand. Zool. (ed. Clark), ii, 1858, p. 177. Logotype, *P. cynaedus* Hoeven, by present designation.

Trichopterus Gray, Cat. Fish. coll. Gronow Brit. Mus., 1854, p. 162. Haplotype, *T. indicus* Gray. Name preocc. by *Trichopterus* Agassiz, 1845, another genus of fishes.

CHEILODACTYLUS FASCIATUS Lacepede.

Cynaedus seu *Sparus mormyrus* Meuschen, Index Zoophyl. Gron., 1781, Pisces No. 221. On Gronow, Zoophylac. No. 221, pl. x, fig. 1. In oceano Indico. Not *Sparus mormyrus* Linne, Syst. Nat. ed. 10, 1758, p. 281, based on Hasselquist. "Habitat in M. infero."

Cheilodactylus fasciatus Lacepede, Hist. Nat. Poiss. v, 1803, p. 5, pl. i, fig. 1. No loc.

Cheilodactylus fasciculatus Bory de St. Vincent, Dict. class. hist. nat. iii, Sept. 1823, p. 532. Error for *C. fasciatus* Lac., ascribed to New Holland.

Pteronemus cynaedus Hoeven, Handb. Dierk., ii (? 1833 ed., p. 247, not seen), 1855 ed., p. 386; Handb. Zool. (ed. Clark) ii, 1858, p. 177. Cape of Good Hope and East Indies?

Trichopterus indicus Gray, Cat. Fish. coll. Gronow Brit. Mus., 1854, p. 162. Habitat in India (On Gronow, Zoophylac. No. 221, pl. x, fig. 1).

Cheilodactylus multiradiatus Castelnau, Mem. poiss. Afr. austr., 1861, p. 12. Cape of Good Hope.

In spite of Bory's remark, "Il se trouve dans les mers de la Nouvelle Hollande," this is not an Australian species, but is evidently South African. According to J. L. B. Smith and other authors, true *Cheilodactylus* has D. xviii-xix, 23-25; A. iii, 9; P. 9 plus 5 free rays; dorsal and anal fins with sheath of 3 to 6 scales. L. lat. about 80. Gill-rakers 12-13. Oblique dark bars on tail-lobes. At least one Australian "*Cheilodactylus*" consequently needs a new generic name and I propose

MORWONG, gen. nov.

Orthotype, *Chilodactylus fuscus* Castelnau = *Morwong fuscus*.

Distinguished from *Cheilodactylus* by having D. xvi-xvii, 31-34; A. iii, 9-10; P. 8 plus 6 free rays; L. lat. 57-62; Tr. 8/1/16 to 9/1/17. Dorsal and anal fins with sheaths of two scale-rows. Gill-rakers about 14 on lower portion. Dorsal fins subequal in height, or with front rays longer than spines in young.

MORWONG FUSCUS (Castelnau)

(Figure 9.)

Cheilodactylus fuscus Castelnau, Proc. Linn. Soc. N. S. Wales iii, May 1879, p. 376. Sydney markets. *Id.* Tenison-Woods, Fish. Fisher. N. S. Wales, 1882, p. 46. pl. xi. *Id.* Steindachner, Sitzungsb. Akad. Wiss. Wien lxxxviii, 1883 (1884), p. 1076. *Id.* Ogilby, Ed. Fish. N. S. Wales, 1893, p. 59, pl. xix. *Id.* Stead, Fish. Austr., 1906, pp. 119 and 263, fig. 43, and Ed. Fish. N. S. Wales 1908, p. 71, pl. xl. *Id.* Ogilby, Proc. Roy. Soc. Qld. xxi, 1908, p. 24. *Id.* Roughley, Fish. Austr. 1916, p. 125, pl. xl. *Id.* McCulloch, Austr. Zool. ii, 1922, p. 94, fig. 248a. And of Australian authors generally.

Cheilodactylus annularis Castelnau, Proc. Linn. Soc. N. S. Wales iii, May 1879, p. 377. Sydney Markets.

? *Dactylosparus fuscus* Fowler, Proc. Acad. Nat. Sci. Philad. lxxv, 1923, p. 44.

The smallest specimen of this, the Red Morwong, which I have seen, is a 2-inch one, unfortunately without locality, in the "old collection" of the Australian Museum (Regd. No. IB. 3681). It has D. xvii, 31; A. iii, 9; P. 15; L. lat. 56; Tr. 9/1/17 and is 45 mm. in standard length. A slightly larger one is illustrated here (IB. 3658). It was trawled off Newcastle, New South Wales, in 40-50 fathoms, in September 1956, by Dr. A. A. Racek and has the following characters: D. xvii, 33; A. iii, 9; P. 14; L. lat. *c.* 57; Tr. 9/1/17 and is 46 mm. in standard length or 2.2 inches overall. Head, 14; depth, 20; eye, 4.5; and interorbital, 4 mm. The longest pectoral ray is 5th from the bottom. Teeth conic. In formalin, its colour was reddish-brown, becoming grey along the back and blue at the viscera. The back and lateral line are crossed by eight oblique dark grey bars. Most of the spinous dorsal fin is dark grey and there are three dark grey blotches along lower part of soft dorsal; proximally the caudal is dark grey; otherwise fins are white. Eye blue. Distinguished from other young morwongs by the fin- and scale-counts and the transverse dark bars.

Grows to 18½ inches. New South Wales and southern Queensland.

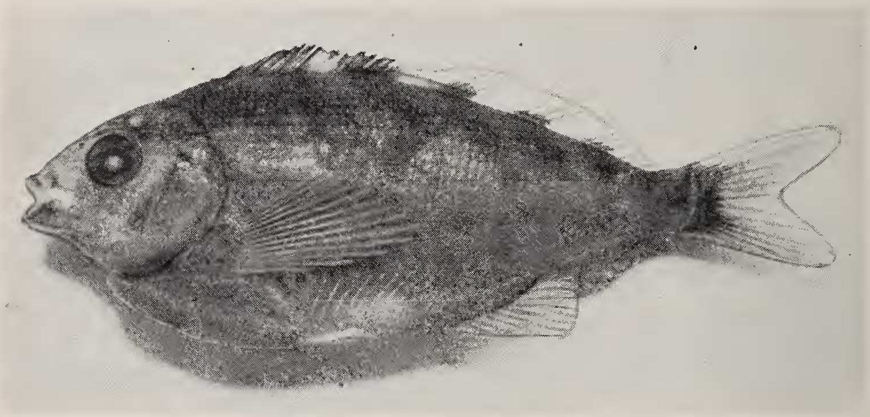


Figure 9.—Red Morwong, *Morwong fuscus*. Juvenile from New South Wales.

Photo.—Dr. A. A. Racek.

Genus NEMADACTYLUS Richardson, 1839.

For synonymy of genus, see Whitley, Austr. Zool. x, 1941, p. 34.

NEMADACTYLUS DOUGLASII (Hector).

(Figure 10.)

Chilodactylus carponemus Richardson, Proc. Zool. Soc., 1850, p. 61. *Id.* Johnston, Proc. Roy. Soc. Tas. 1883 (1884), p. lviii. *Id.* Ogilby, Ed. Fish. N. S. Wales, 1893, p. 55, pl. xviii and the *Dactylopagrus carponemus* of most authors dealing with eastern Australian specimens. Not *C. carponemus* Cuvier, Regne Anim. ed. 2, ii, 1829, p. 177 which equals *Cichla macropterus* Bloch & Schneider.

Chilodactylus douglasii Hector, Trans. N. Z. Inst. vii, July 1875, p. 244, pl. x, fig. 11b. Ngunguru and Bay of Islands, New Zealand. And of authors.

Chilodactylus morwong Ramsay, Cat. Exhib. N.S.W. Court, 1883, pp. 9 and 41. Tasmania; *nomen nudum*. *Id.* Ramsay & Ogilby, Proc.

Linn. Soc. N. S. Wales (2) i, 1886, pp. 879 and 881. Botany Bay, N.S.W. Type in Austr. Mus. seen. New synonym of *douglasii.*

Chilodactylus polyacanthus Ramsay & Ogilby, Abstr. Proc. Linn. Soc. N. S. Wales 25 Aug. 1886, p. iv and Proc. Linn. Soc. N. S. Wales (2) i, 1886, p. 880. *Nomen nudum.*

Dactylosparus douglasi Phillipps, N. Zeal. Journ. Sci. Tech. iv, 1921, p. 115; v, 1922, p. 92, with Hodgkinson.

Dactylopagrus morwong Waite, Rec. S. Austr. Mus. ii, 1921, p. 123 and of authors. *Id.* Roughley, Fish. Austr, 1951, p. 97, pl. xxxvi.

Sciaenoides morwong Whitley, Rec. Austr. Mus. xix, 1935, p. 235.

Chelidonichthys douglasii Phillipps, Nature in N. Zeal., Native Fish., 1949, p. 44 and figs.

The Morwong (*N. douglasii*) and the Jackass Fish (*N. macropterus*) are sometimes difficult to distinguish apart. Both differ from the Western Australian Queenfish (*N. valenciennesi*) in having deeper forms, less than 30 dorsal and 18 anal rays and less than 60 l. lat. scales. Key:

A. No black nuchal band. Young with dark blotch about middle of length near l. lat. In older fish, last anal ray is longer than eye-diameter. D. xvii-xix, 26-30; A. iii, 16-17; P. 8-9 plus 6-7. L. lat. 55 59. Eye slightly smaller, nape less concave and snout blunter .... *douglasii*

AA. Black nuchal band nearly always present. No dark blotch on side of young. In older fish, last anal ray shorter than eye-diameter. D. xvii-xviii, 25-28; A. iii, 14-15; P. 9 plus 6. L. lat. 54-55 .... *macropterus*

New Zealanders and Australians have independently worked on the biology of their Porae (*douglasii*) and Morwong (*morwong*) without realising that the two are conspecific, as is evidently the case, first discovered by Mr. J. Moreland in Wellington (in lit.) and since confirmed by other colleagues with whom I had discussions when recently in New Zealand.

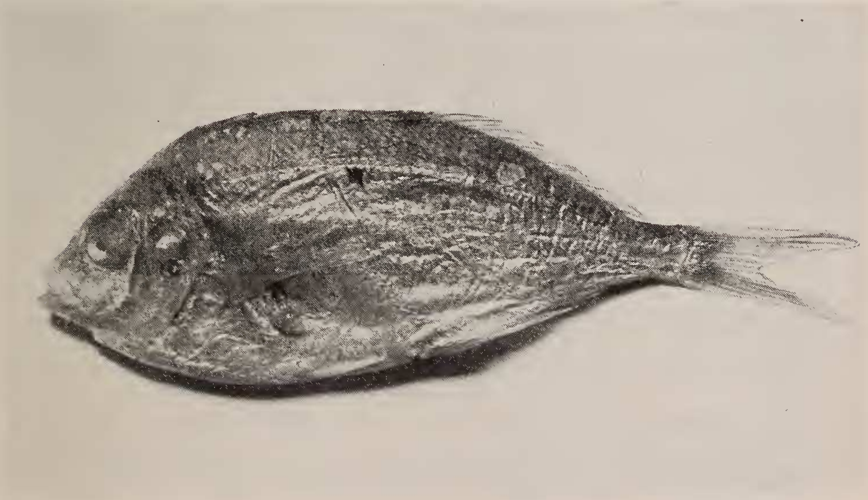


Figure 10—Morwong, *Nemadactylus douglasii.* Juvenile from New South Wales.

Photo.—Dr. A. A. Racek.

A young specimen, figured here, is 59.5 mm. in standard length (Austr. Mus. regd. No. IB. 1099) and has D. xviii, 29; A. iii, 17; P. 10 plus 6; it was olivaceous above and silvery below with a blackish spot below about the 20th L. lat. scale; first dorsal fin grey.

Loc.—Off Disaster Bay, southern New South Wales, taken by danish seine in 40 fathoms, 7 Nov. 1941; coll. Dr. D. L. Serventy, C.S.I.R.

NEMADACTYLUS MACROPTERUS (Bloch & Schneider)

(Figure 11.)

Cichla macroptera Bloch & Schneider, Syst. Ichth., 1801, p. 342. South Island of New Zealand.

Sciaena macroptera Bloch & Schneider, Syst. Ichth., 1801, p. 342, ex Forster, MS. South Is., N. Zealand. *Id.* Forster, Descr. Anim. (ed. Lichtenstein), 1844, p. 136.

Chilodactylus carponemus Cuvier, Regn. Anim. ed. 2, ii, 1829, p. 177. New name for *Cichla macroptera* Bl. Schn., New Zealand. *Id.* Cuvier & Valenciennes, Hist. Nat. Poiss. v, 1830, p. 362, part, not plate. *Id.* Richardson, Trans. Zool. Soc. Lond. iii, 1842, p. 99.

Sparus carponemus Cuvier & Valenciennes, Hist. Nat. Poiss. v, 1830, p. 363, ex Parkinson, MS. Queen Charlotte Sound, New Zealand.

Nemadactylus concinnus Richardson, Proc. Zool. Soc. Lond. vii, 1839, p. 97; Trans. Zool. Soc. Lond. iii, 1842, p. 116, pl. iv, fig. 2. Port Arthur, Tas. *Id.* Sauvage, Compt. Rend. Paris 81, 1875, p. 988 and Arch. Zool. Exper. viii, 1879, pp. 3 and 22. *Id.* Whitley & Phillipps, Trans. Roy. Soc. N. Zeal. 69, 1939, p. 234, pl. xxi, fig. 3.

Sciaenoides abdominalis Richardson, Trans. Zool. Soc. Lond. iii, June 16, 1842, p. 101; and later works. Ex Solander, MS. N. Zealand localities.

Chilodactylus macropterus Richardson, Rept. 12th meet. Brit. Assn. Adv. Sci. 1842 (1843), p. 19. And of authors.

Cheilodactylus aspersus, Richardson Proc. Zool. Soc. Lond. xviii, 1850, p. 64. Port Arthur, Tas. *Id.* Gunther, Cat. Fish. Brit. Mus. ii, 1860, p. 79. And of authors.

Dactylosparus macropterus Waite, Mem. Nat. Club N.S.W., 1904, p. 32. And of authors.

Sciaenoides aspersus Whitley, Rec. Austr. Mus. xx, 1937, p. 21.

Sciaenoides macropterus Whitley, Austr. Mus. Mag. vii, 1940, p. 179, fig. *Id.* Fowler, Proc. Amer. Philos. Soc. 82, 1940, p. 779, fig. 59.

Nemadactylus macropterus Whitley, Austr. Zool. x, 1941, p. 35, and of most modern authors.

To illustrate the young, silvery "Paper Fish" stage of the Jackass Fish I have chosen one (Austr. Mus. regd. No. IB. 777) found by Mr. K. A. Hindwood washed ashore at Long Reef, near Sydney, N. S. Wales, on 20 July 1941. It is 40 mm. in standard length and the fins are too broken for the rays to be counted. L. lat. 65. Dark grey above, beetroot-red on sides, brilliant silvery below. No dark spot near l. lat. Lower pectoral rays simple, but not produced.

Family GASTEROCHISMATIDAE.

GASTEROCHISMA MELAMPUS Richardson, 1845.

The Butterfly Mackerel can now be recorded from Victoria. A 6½ inch specimen was caught at the breakwater at Portland, Victoria, and was figured in the Sunday Mail (Adelaide) of 26 January 1957. I am grateful to Mr. J. Scott of Warrnambool, Victoria, for calling my attention to this occurrence and supplying me with data and a photograph of the specimen.

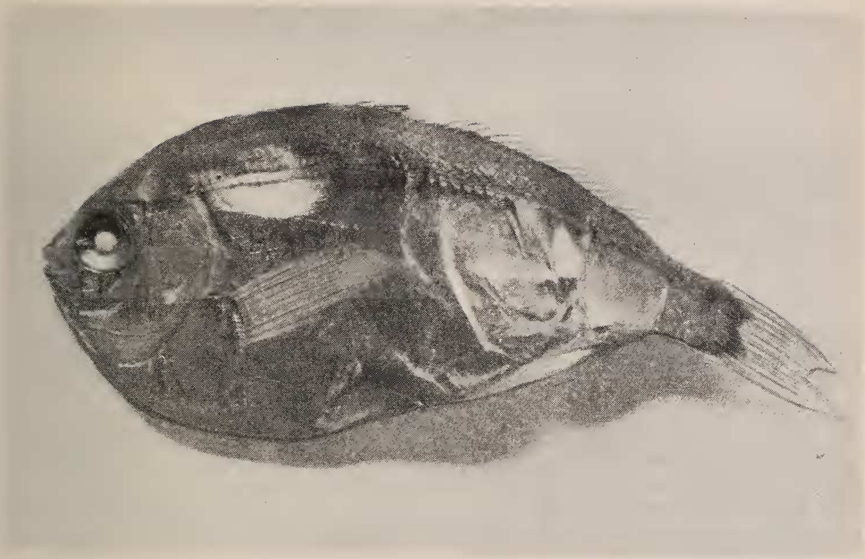


Figure 11.—Jackass Fish, *Nemadactylus macropterus*. Juvenile from New South Wales.
Photo.—Dr. A. A. Racek.

Family ANTENNARIIDAE.

Genus ANTENNARIUS Daudin, 1816.

ANTENNARIUS PICTUS (Shaw & Nodder).

Lophius pictus Shaw & Nodder, Nat. Miscell. v, May 1, 1794, pl. clxxvi, upper fig. New Holland (Banks) = Botany Bay, New South Wales. *Id.* Shaw, Gen. Zool. v, 2, 1804, p. 386, pl. clxv, upper fig. *Id.* Good & Gregory, Pantologia xiii, Nat. Hist., 1813, pl. cliii, fig. 1.

Lophius histrio var. *pictus* Bloch & Schneider, Syst. Ichth., 1801, p. 142.

Chironectes variegatus Schinz, Das Thierreich (Cuvier) ii, 1822, p. 501, footnote; Cuvier, Regne Anim. ed. 2, ii, 1829, p. 252 and Cuvier & Valenciennes, Hist. Nat. Poiss. xii, 1837, p. 422. No locality. Preoccupied by *C. variegatus* Rafinesque, Prec. Somiol., 1814, p. 19, *fide* Jordan, Proc. Acad. Nat. Sci. Philad. 1917, p. 278.

Chironectes pictus Cuvier, Regne Anim., ed. 2, ii, 1829, p. 252.

Chironectus pictus Swainson, Nat. Hist. Class. Fish. Amphib. Rept., ii, 1839, p. 330. Not of Hoeven, Handb. Zool. (ed. Clark), 1858, p. 141, pl. iii, fig. 6, which is a *Pterophrynoides*.

Pterophrynoides histrio var. *pictus* Whitley, Austr. Zool. vi, 1931, p. 328.

An uncommon little angler fish, found in New South Wales, where it grows to about 3¾ inches. It is not a *Pterophrynoides* because the esca is well developed and the skin is bristly. D. i/i/i/ about 14 to 17. This Painted Angler was originally obtained at Botany Bay, New South Wales, by or for (Sir) Joseph Banks. Later a drawing was made of it, perhaps by the convict-artist Thomas Watling, for I found at the British Museum that No. 318 of the "Watling drawings" there was the original of Shaw and Nodder's plate of *Lophius pictus*, the "compressed brown Lophius with yellowish blotches margined with red." Their species was wrongly regarded by authors as a synonym of *histrio* Linn., or, in Gunther's Catalogue, as *Antennarius multiocellatus* var. *leucosoma* Bleeker, though Bleeker himself had (Nat. Tydschr. Ned. Ind. vi, 1854, p. 104) synonymised it with *chironectes* Cuvier. Watling's figure has been reproduced, facing left or right at the whim of engravers, in several books, including Oliver Goldsmith's "History of the Earth and Animated Nature" (1860 ed., Ichth. pl. xlvii, fig. 14) and I feel that *pictus* should be reinstated as a species of *Antennarius*. The Australian Museum has but few specimens, one from Ballina, New South Wales, in the fresh state, having been pale salmon-coloured or yellowish pink, crossed by several large irregular greyish blotches of uneven tone, the pattern continued over eyes and inside mouth; belly fairly uniform yellowish. As Swainson (op. cit. i, 1838, p. 202) has written: "The imagination can scarcely conceive more fanciful forms than such as are actually found in this group; and the monstrous combinations which painters have represented under the aspect of animals, can scarcely surpass the singularity of many of these real fish."

GOLEM, gen. nov.

Orthotype, *Antennarius cryptacanthus* Weber (Siboga Exped. Fische, 1913, p. 564, pl. iii, fig. 2, from Indonesia) = *Golem cryptacanthus*.

Differs from *Antennarius* Daudin, 1816, in lacking an illicium, all the dorsal spines being completely concealed by integument. Lips papillose. Mouth small, oblique. Skin smooth, lateral line system of spaced papillae, no conspicuous dermal processes.

Dorsal and anal fins joined to caudal. About 12 to 14 dorsal rays, 7 to 8 anal, 8 pectoral and 5 or 6 ventral.

Mr. Melbourne Ward collected a specimen from Port Moresby, Papua in 1933. (Austr. Mus. regd. No. IA. 5720) with the following characters:—

D. (iii) 14; A. 8; P. 8; V. 5; C about 10.

Head (15.5 mm.) 2.3, depth (24) 1.5 in standard length (37).

Eye (2) 1.7 in snout (3.5) and 3 in interorbital (6).

Colour: green, sprinkled on head, body and fins with regular, small, darker green spots; irregular dark brown marks on head.

The range of *Golem cryptacanthus* is thus from Indonesia to Papua. It is an angler-fish without any angling apparatus and rather recalls the allies of *Erosa* amongst the scorpion-fishes and *Gobiodon* in the gobies.

Family SPHAEROIDIDAE.

Genus SPHAEROIDES Anon., 1798.

SPHAEROIDES HALSTEADI, sp. nov.

(Figure 12.)

D. 2, 8; A. 7; P. i, 15; C. 7 branched rays.

Head without spines, mostly smooth; skin on top of head much wrinkled, mostly longitudinally. Eye covered by skin. Teeth laminate. Lips papillose. Chin receding. Each nostril a low papilla with two openings.

Head (31 mm.) 3.1 in standard length (102). Eye 10; interorbital 14; snout 15; gill-opening, 7 mm.

Gill-opening without papillae or cartilaginous spur. Lateral line very indistinct, apparently restricted to thin canals behind nostrils, eyes, and pectoral fins.

Body mostly smooth but a spinous area on middle of belly extends up each side behind pectoral fins. A patch of small spines on nape. No postero-ventral ridge and no scale-like spines.

Dorsal and anal fins irregularly rounded, not pointed or lobed, their last rays more than half length of anterior rays. Pectoral rounded. Caudal bisinuate, upper lobe longer, pointed.

Colours when fresh: upper half olivaceous, lower half white. Four or five indistinct darker crossbands on back. Along sides are honey-coloured round spots about the size of pupil. Fins olivaceous to yellow. Brown blotch before pectoral base; dark grey area before caudal root. Eye blue with bronze and gold iris. Nostrils golden. Teeth brown to dull white. No dark spots on back.

Length $4\frac{7}{8}$ inches.

Loc.—Chinaman's Beach, Middle Harbour, Sydney, New South Wales, 18 Aug. 1956. Coll. G. P. Whitley.

Described and figured from the holotype (Austr. Mus. regd. No. IB. 3623) and named after Dr. Bruce W. Halstead of California for his studies on poisonous and venomous fishes. Characterised by its coloration, rounded fins, having interorbital subequal to snout, few pectoral rays and restricted spiny areas on body.

One may perhaps deduce from the inflatable stomach and the long lower pectoral rays that this species may float at the surface a good deal and it is in several respects intermediate between *Sphaeroides* and *Liosaccus*.

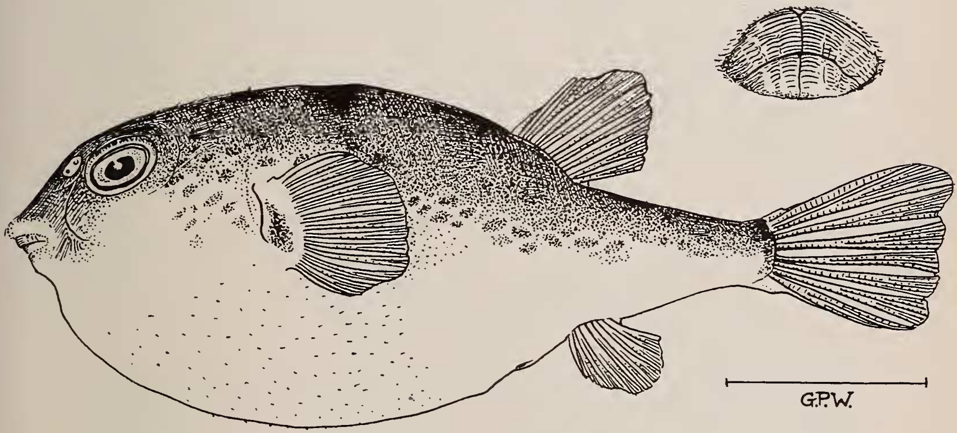


Figure 12.—Toado, *Sphaeroides halsteadi*. Holotype from New South Wales. Inset: the laminate teeth.
G. P. Whitley del.

Family GOBIIDAE.

Genus KOUMANSETTA Whitley, 1940.

Seychellea Smith (Ann. Mag. Nat. Hist. (12) ix, 1957, p. 726, not *Seychellesia* Boliver, 1912, in Orthoptera) is evidently congeneric with my *Koumansetta* (Austr. Zool. ix, 1940, p. 425, fig. 43) though his species *K. hectori* (Smith), differs in having more dorsal and anal rays, fewer scales, and in proportions and colouring. *Amblygobius inornatus* Herre, 1927 and *A. myersi* Herre, 1935 may be other species of *Koumansetta*.